

NOTEBOOK COMPUTER HAVING A HINGE DEVICE ENABLING A DISPLAY UNIT TO BE SEPARABLE FROM A MAIN BODY

CROSS-REFERENCE TO RELATED APPLICATIONS

This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. § 119 arising from an application for Notebook Computer Having A Hinge Device Enabling A Display Unit To Be Separable From A Main Body earlier filed in the Korean Industrial Property Office, on the 4th of Oct. 1995, and there duly assigned Ser. No. 33889/1995.

FIELD OF THE INVENTION

The present invention relates to a hinge device for a notebook computer, and more particularly, to a hinge device for easily combining and separating a display unit with and from a main body of a notebook computer.

BACKGROUND OF THE INVENTION

A notebook computer typically is made up of a display unit and a main body containing main elements for operating the computer. The display unit is pivotally connected to the main body by a

hinge device so that the display unit can be folded over the main body when the user is finished using the device.

It is often desired, for maintenance or for upgrading, to have a notebook computer where the cover containing the display unit can easily be separated from and reattached to the main body. The prior art discloses many designs for notebook computers that allow the cover containing the display to be easily attached to and detached from the main body. For example, German patent No. 3936-261-A shows a portable notebook computer with a detachable lid containing a display. An electrical connector on the bottom side of the cover mates with a socket in the main body, providing an electrical connection between the cover and the main body. The connector/socket combination folds or pivots into a recess allowing the cover containing the display to rotate open and closed. Similarly, U.S. Pat. No. 5,138,565 for Shielded Electronic Apparatus Having a Removable Shielded Display to Satou discloses a notebook computer having a removable display containing cover. A notebook computer contains a connector electrically connecting the display unit to the main body. In addition, it contains hinge shafts on either side for the connector. A cable extends along the hinge axes of the device. In addition, the disclosure contains the electromagnetic shielding in the main body. Also, U.S. Pat. No. 5,262,759 for a Removable Computer Display Interface to Moriconi et al. discloses a removable computer display interface. A connector is under the side of the display, and the display is hingedly attached to the main body. The display is able to rotate open and close with respect to the main body well maintaining electrical contact.

U.S. Pat. No. 5,196,993 for a Removable Stand Alone Display for Laptop Computer, U.S. Pat. No. 5,030,128 for a Docking Module, and U.S. Pat. No. 4,978,949 for a Locking Mechanism and Support Legs for Removable Display Assembly, all to Herron et al., discloses a laptop computer with removable display containing cover. A lever is used to detach the display unit from the main body. An electrical cable, extends from the main body to the display unit, and the display unit is operationally rotatable during use. The drawback with using levers is that they can be easily be

activated accidentally. Levers can pop-out or come loose, thus causing the display unit to be inadvertently separated from the computer.

U.S. Pat. No. 5,041,965 for a Laptop Computer With Detachable Display For Overhead Projector to Chen discloses a laptop computer with a detachable display. Fig. 2 which shows male and female electrical connectors for electrical connection as well as cylindrical lug 622 from that each side for each hinge for mechanical connection between the cover and the main body. As a result, the notebook computer pivots via pair of hinge mechanisms located at the rear of the main body where connects to the bottom of the display unit. The display unit is free to rotate open and close while maintaining the electrical contact with the main body. The drawback with the above design is that the display will separate should the user inadvertently lift the notebook computer by the display.

What is needed is an improved design for a notebook computer that has the detachable display feature that is both reliable and easy to operate, and does not allow the display unit to easily become inadvertently separated from the computer.

SUMMARY OF THE INVENTION

It is therefore an object to provide a design for a notebook computer that allows the user to easily detach and reattach the display unit to the computer without encountering the risk of inadvertent detachment.

To realize the above object, the present invention provides a notebook computer comprising a main body and a display unit. According to a major feature of the invention, a hinge member extends from a lower end of the display unit, and a connector is pivotally fixed to the hinge member. The connector is designed to transmit an electrical signal to the display unit. A connector fixing portion is formed in the main body so that the connector can be tightly fitted thereinto while providing an electrical connection. Therefore, the display unit can be firmly fixed on the main body by fitting the connector into the connector-fixing portion and it can rotate since the connector is pivotally connected to the hinge member.

According to another feature of the present invention, a first and a second pivotal detents are formed on the main body, which pivotally attach opposite ends of the hinge member in order to ensure a stable connection between the cover and the main body.

Lastly, at least one of the first and second pivotal detents are slidably mounted on the top side of the main body, allowing for the separation and attachment of the display unit to and from the main body.

BRIEF DESCRIPTION OF DRAWINGS

The subject of the invention is described in greater detail by way of example with the aid of the accompanying drawings, wherein:

FIG. 1 is an exploded perspective view of a hinge device of a notebook computer in accordance with the present invention;

FIG. 2 is a cross-sectional view of the hinge axis of the detachable notebook computer when fully assembled; and

FIG. 3 is a cross-sectional view of the hinge axis of the detachable notebook computer during attachment or detachment of the cover to or from the main body.

DETAILED DESCRIPTION OF THE INVENTION

Referring first to FIGS. 1 and 2, there are shown views of a hinge device according to a preferred embodiment of the